Chapter V

TRANSPORTATION AND PUBLIC UTILITIES

INTRODUCTION

The transportation system of Waukesha County provides the basis for movement of goods and people into, out of, through, and within the County. An efficient transportation system is essential to the sound social and economic development of the County and of the Region of which the County is a part. An understanding of the existing transportation system is therefore fundamental to the preparation of a comprehensive development plan for the County.

Public utility systems are among the most important and permanent elements influencing the growth and development of the County. These utilities and the land use pattern which they serve and support are mutually interdependent in that the land use pattern determines the demand for, and loadings upon, the utility systems; the utility systems, in turn, form a basic framework for land use development. Such public utility systems are, moreover, closely linked to the natural resource base, constituting, in effect, extensions to, or modifications of, the surface-water and groundwater systems. For these reasons, information regarding existing public utility systems is also essential to the comprehensive planning process.

Accordingly, this chapter presents a description of existing transportation and public utility facilities in Waukesha County. Included are descriptions and analyses of the existing arterial street and highway system, public transit facilities, railway facilities, airport facilities, bikeways, sanitary sewerage facilities, water supply facilities, and stormwater management facilities. Also presented in this chapter is a description of those quasi-public utilities upon which urban development is highly dependent: electric power, natural gas, and communication systems. Solid waste disposal and recycling activities in the County are described in this chapter as well.

TRANSPORTATION FACILITIES

Arterial Streets and Highways

The arterial street and highway system serving Waukesha County in 1991 is shown on Map 51. As shown on Map 51, the existing arterial network in the eastern portion of the County is relatively densely spaced, with arterials occurring at about one-mile intervals in both the north-south and east-west directions. The existing arterial network in the rest of the County is less densely spaced, with arterials occurring at about two- to three-mile intervals. The arterial system totals 721 miles in length, with about 60 miles, or 8 percent, consisting of freeways and about 661 miles, or 92 percent, consisting of standard arterial streets.

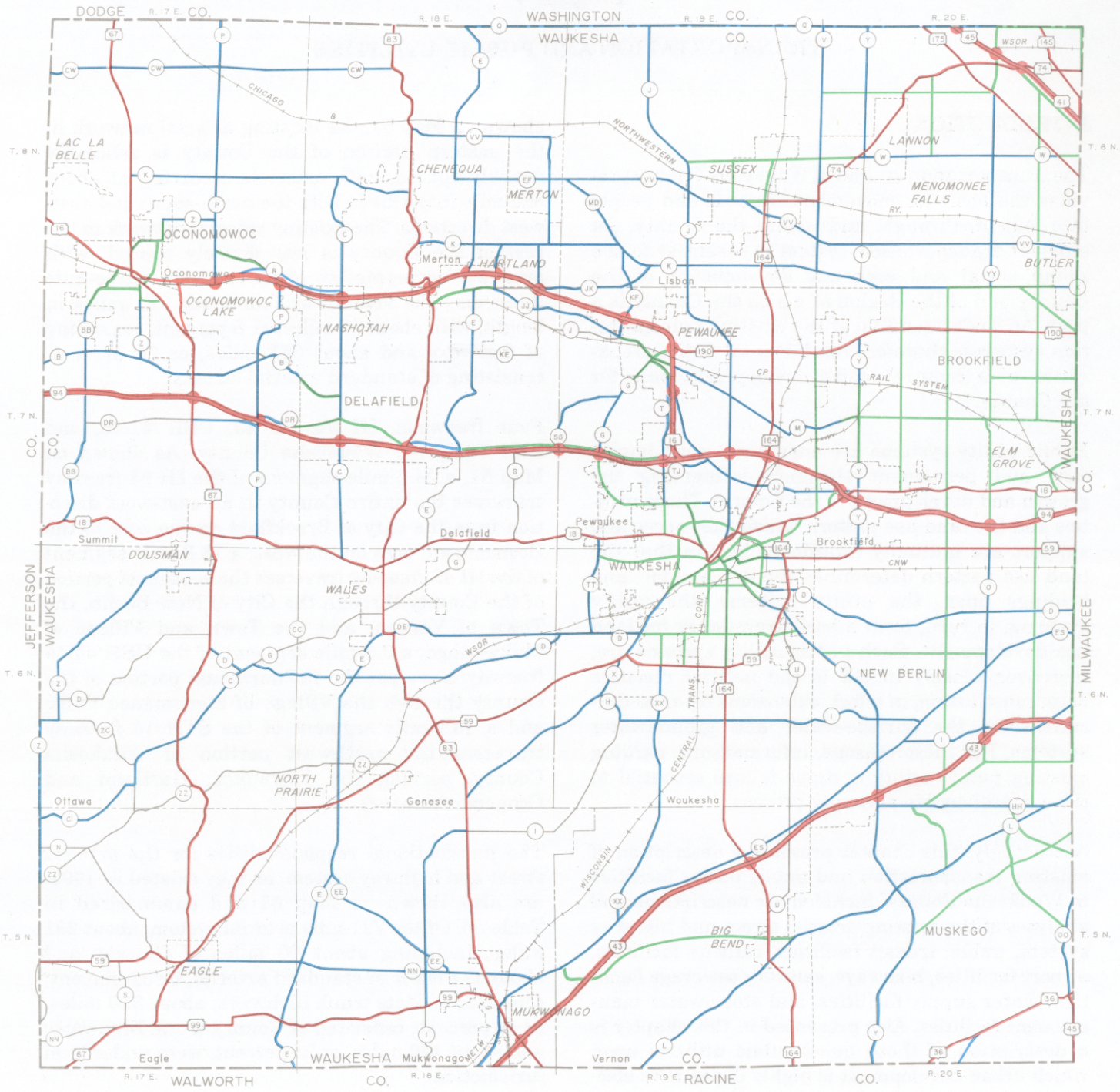
Four freeways, IH 94, IH 43, USH 41/45, and STH 16, serve Waukesha County. As shown on Map 51, a 24.6-mile segment of the IH 94 freeway traverses the entire County in an east-west direction from the City of Brookfield on the east to the Oconomowoc area on the west; a 16.3-mile segment of the IH 43 freeway traverses the southeast portion of the County through the City of New Berlin, the Town of Vernon, and the Town and Village of Mukwonago; a 3.6-mile segment of the USH 41/45 freeway traverses the far northeast portion of the County through the Village of Menomonee Falls; and a 15.2-mile segment of the STH 16 freeway traverses the northwest portion of Waukesha County, serving the Pewaukee, Hartland and Oconomowoc areas.

The jurisdictional responsibilities for the arterial street and highway system, as they existed in 1991, are also shown on Map 51 and summarized in Table 56. Of the 721-mile arterial system, about 231 miles, including about 60 miles of freeway and about 171 miles of standard arterial, or 32 percent, consisted of State trunk highways; about 320 miles, or 44 percent, consisted of County trunk highways; and about 170 miles, or 24 percent, were under local jurisdiction.

Annual average weekday traffic volumes for the arterial street and highway system in Waukesha County for the year 1991 are depicted on Map 52. As indicated on Map 52, traffic volumes on the IH 94 freeway in the eastern portion of the County between the Milwaukee-Waukesha County line and the interchange with USH 18 averaged more than 90,000 vehicles per day in 1991. Traffic volumes on IH 94 in the rest of Waukesha County were also

Map 51

JURISDICTIONAL ARTERIAL STREET AND HIGHWAY SYSTEM IN WAUKESHA COUNTY: 1991



LEGEND

ARTERIAL STREETS AND HIGHWAYS

FREEWAY

STATE TRUNK HIGHWAY

INTERCHANGE

STANDARD ARTERIAL

STATE TRUNK HIGHWAY

COUNTY TRUNK HIGHWAY

LOCAL TRUNK HIGHWAY

GRAPHIC SCALE

0 1 2 MILES

0 4000 8000 12000 16000 FEET

Source: SEWRPC.

relatively high, averaging from 40,000 to 89,999 vehicles per day between USH 18 and STH 83, and between 25,000 to 39,999 vehicles per day between STH 83 and the Waukesha-Jefferson County line. In addition to IH 94, the most heavily traveled arterial streets and highways, those with volumes averaging more than 25,000 vehicles per day in 1991, were generally located in the east-central portion of the County. Those heavily traveled arterials included: USH 18 between the Milwaukee-Waukesha County line and the City of Waukesha, Capitol Drive (STH 190) between the Milwaukee-Waukesha County line and Brookfield Road, Moorland Road (CTH O) between Blue Mound Road (USH 18) and Cleveland Avenue (CTH D), IH 43 between the Milwaukee-Waukesha County line and STH 164, and USH 41/45.

The existing level of traffic congestion on the arterial street and highway system, based upon a comparison of annual average daily traffic volumes and existing design capacities, is shown on Map 53. Of the approximately 721 miles of arterial streets and highways in the County in 1991, about 72 miles, or 10 percent, were operating over design capacity; about 53 miles, or 7 percent, were operating at capacity; and about 596 miles, or 83 percent, were operating under capacity. Most of the congested arterial street segments operating at or over design capacity were located in the east-central portion of the County. Congested arterials in this area included: IH 94 between the Milwaukee-Waukesha County line and Moorland Road (CTH O), Greenfield Avenue (STH 59) between the Milwaukee-Waukesha County line and STH 164, Capitol Drive (STH 190) between Lilly Road and STH 164, Silver Spring Road (CTH VV) between Lilly Road and the Village of Sussex, STH 164 between STH 59 and the Village of Big Bend, the entire length of STH 36 in the City of Muskego, and STH 16 through the City of Oconomowoc in western Waukesha County.

The traffic-carrying capacity of the arterial street system, while dependent upon a number of factors, is primarily a function of the number of traffic lanes and the type of facility. As shown in Table 57, a two-lane urban arterial generally has a design capacity of about 13,000 vehicles per average weekday, a four-lane undivided urban arterial has a design capacity of about 17,000 vehicles per average weekday, a four-lane divided urban arterial has a design capacity of about 25,000 vehicles per average weekday, and a six-lane divided urban arterial has a design capacity of about 35,000 vehicles per average weekday. The design capacities cited are for urban arterials typically having urban cross-sections with curb and gutter and auxiliary parking lanes, which can also serve as distress lanes and, importantly, serve as bypass lanes at intersections. The traffic capacities of urban arterials are established by the capacity of the intersections with other arterial streets, which are typically controlled by traffic signals. As is also shown in Table 57, a four-lane urban freeway has a design capacity of about 60,000 vehicles per average weekday and a six-lane urban freeway has a design capacity of about 90,000 vehicles per average weekday.

The comparable capacities for rural highways typically having cross-sections with shoulders and roadside ditches are also given in Table 57. The shoulders of rural highways generally are not paved and may not accommodate the full width of a vehicle. Thus, no full auxiliary lanes are provided. This reduces the volume of traffic which can safely and efficiently be accommodated, particularly on two-lane rural roadways in areas where turning movements are frequent and where multiple points of ingress and egress to abutting lands may be permitted along the highway. Rural highways also typically have higher speed limits than do urban highways, generally exceeding 35 miles per hour and ranging up to 55 miles per hour. Less traffic can generally be safely and efficiently accommodated on two-lane highways with higher speed limits. Also, the design capacity of stop sign-controlled arterial intersections is less than the capacity of traffic signal-controlled arterial intersections. Stop sign-controlled intersections are more typical of rural arterial highway intersections, while signalized intersections are more typical of urban arterial

Table 56

EXISTING ARTERIAL STREET AND HIGHWAY SYSTEM MILEAGE BY JURISDICTION IN WAUKESHA COUNTY: 1991

Jurisdiction	Arterial Miles	Percent of Total
Freeway		
State Trunk Highway	59.7	8.2
Standard Arterial		
State Trunk Highway	171.6	23.8
County Trunk Highway	320.0	44.4
Local Trunk Highway	169.7	23.6
Total	721.0	100.0

Source: SEWRPC.

Map 52

AVERAGE WEEKDAY TRAFFIC VOLUMES ON THE ARTERIAL STREET AND HIGHWAY SYSTEM IN WAUKESHA COUNTY: 1991

LEGEND

AVERAGE WEEKDAY TRAFFIC VOLUMES

- LESS THAN 13,000
- 13,000 TO 24,999
- 25,000 TO 39,999
- 40,000 TO 59,999
- 60,000 TO 89,999
- 90,000 OR GREATER

GRAPHIC SCALE

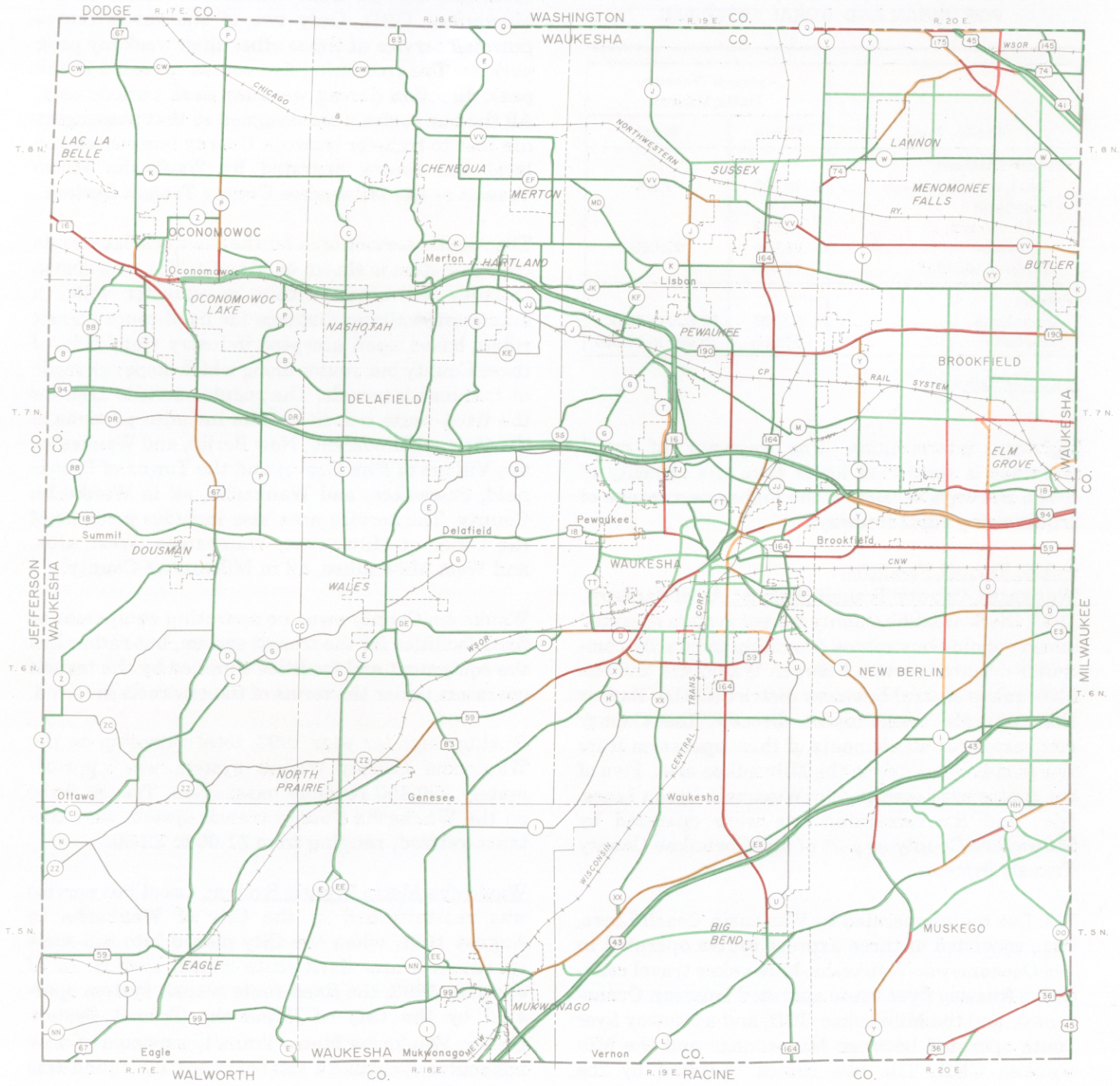
0 1 2 MILES

0 4000 8000 12000 16000 FEET

Source: SEWRPC.

Map 53

TRAFFIC CONGESTION: VOLUME-TO-CAPACITY RATIOS ON THE ARTERIAL STREET AND HIGHWAY SYSTEM IN WAUKESHA COUNTY: 1991



LEGEND

- FREEWAY VOLUME OVER DESIGN CAPACITY
- STANDARD ARTERIAL VOLUME OVER DESIGN CAPACITY
- FREEWAY VOLUME AT DESIGN CAPACITY
- STANDARD ARTERIAL VOLUME AT DESIGN CAPACITY
- FREEWAY VOLUME UNDER DESIGN CAPACITY
- STANDARD ARTERIAL VOLUME UNDER DESIGN CAPACITY

GRAPHIC SCALE
0 1 2 MILES
0 4000 8000 12000 16000 FEET

Source: SEWRPC.

Table 57

AVERAGE WEEKDAY DESIGN CAPACITIES FOR URBAN AND RURAL ARTERIALS

Facility Type	Average Weekday Traffic Volume	
	Urban	Rural
Standard Arterial		
Two-Lane (undivided)	13,000	7,000
Four-Lane		
Undivided	17,000	--
Divided	25,000	22,000
Six-Lane (divided)	35,000	--
Freeway		
Four-Lane	60,000	52,500 to 60,000
Six-Lane	90,000	85,000 to 90,000

Source: SEWRPC.

highway intersections. The capacity of rural freeways is somewhat lower than the capacity of urban freeways because of the higher percentage of trucks using rural freeways.

Public Transit Facilities

Waukesha County Transit System: As of January, 1993, the Waukesha County transit system operated seven regular bus routes providing primarily commuter-oriented service between Waukesha and the Milwaukee central business district (CBD). Rather than operate these routes directly, the County contracted for all elements of their operation from two transit operators in the Milwaukee area. Five of the routes were operated by Wisconsin Coach Lines, Inc., and the remaining two were operated by Milwaukee County as part of its Milwaukee County Transit System.

The five routes operated by Wisconsin Coach Lines, Inc., consisted of three express routes operated in the Oconomowoc-Waukesha-Milwaukee travel corridor, a freeway flyer route operated between Oconomowoc and the Milwaukee CBD, and a freeway flyer route operated between Mukwonago and the Milwaukee CBD. The two routes operated by the Milwaukee County Transit System consisted of one freeway flyer route, between Menomonee Falls and the Milwaukee CBD, and an extension of the local Wells-Wisconsin route (Route No. 10) to serve the Brookfield Square shopping center and adjacent office development in the City of Brookfield. Map 54 shows the location of these seven routes in Waukesha and Milwaukee Counties.

Service schedules on the seven aforementioned bus routes were designed primarily to provide weekday commuter service from Waukesha County to the Milwaukee CBD. Only two of the seven routes provided service at times other than weekday peak periods. The remaining five routes operated in the peak direction during weekday peak periods only. All the bus routes were designed so that passengers are able to transfer between County bus routes and local bus routes operated by Waukesha Metro Transit or the Milwaukee County Transit System.

The regular service area for the County's fixed-route transit system is shown on Map 54. The area shown includes all areas within one-quarter mile, a maximum walking distance for fixed-route transit riders based upon accepted industry standards, of those County bus routes along which stops are made at frequent intervals. The regular service area for the fixed-route transit system includes portions of the Cities of Brookfield, New Berlin, and Waukesha; the Village of Elm Grove; and the Towns of Brookfield, Pewaukee, and Waukesha, all in Waukesha County. The service area also includes portions of the Cities of Milwaukee, Wauwatosa, West Allis, and West Milwaukee, all in Milwaukee County.

Waukesha County owns no operating equipment or fixed facilities for the transit system, but rather has the equipment and facilities supplied by the transit operators under the terms of the contracts involved.

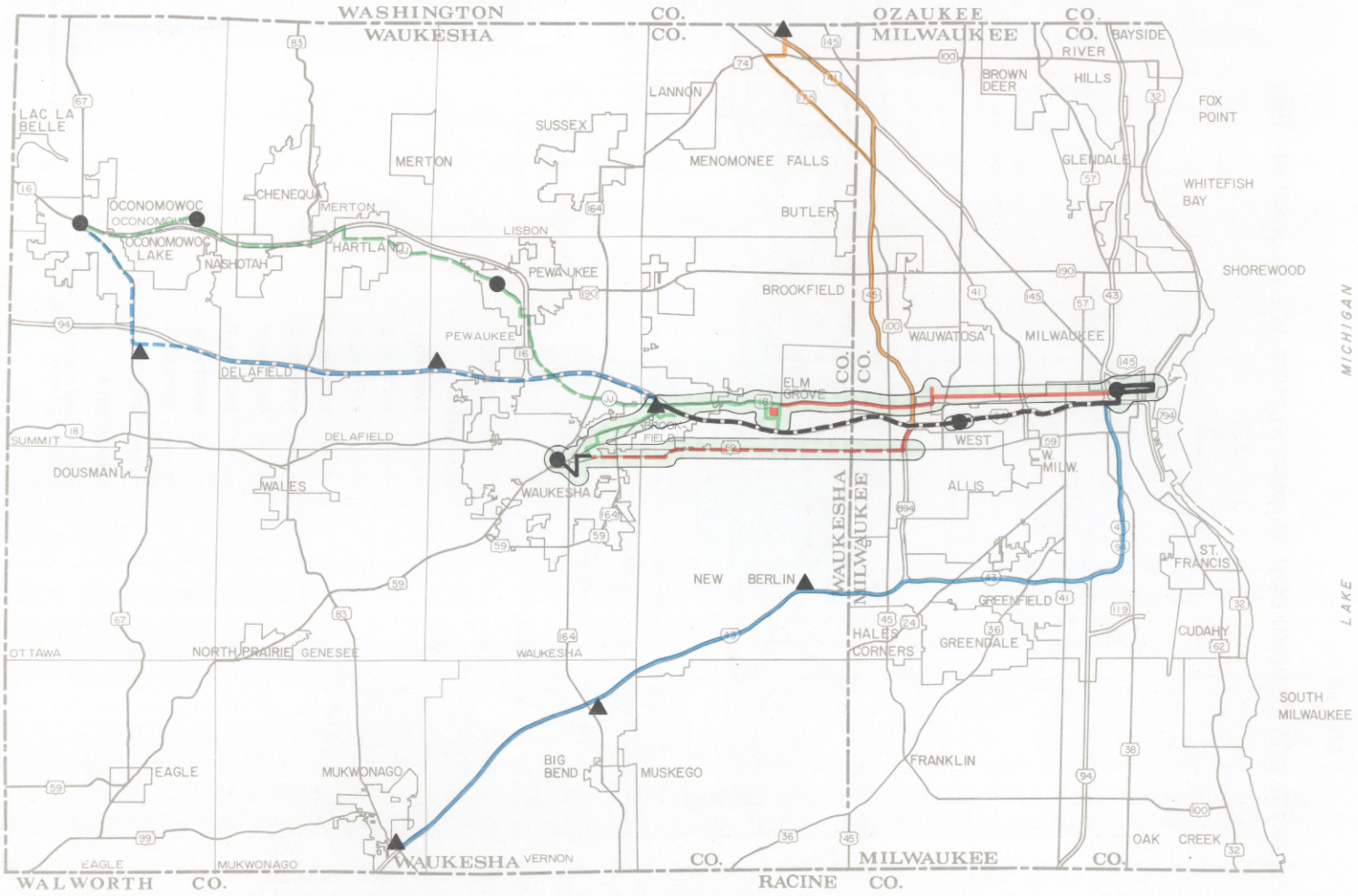
During calendar year 1992, total ridership on the Waukesha County transit system was approximately 299,400 revenue passengers. Transit fares on the Waukesha County transit system were distance-related, ranging from $1.00 to $2.50.

Waukesha Metro Transit System: Local bus service was reestablished in the City of Waukesha in August 1981, when the City placed into full-scale operation a new fixed-route transit system. As of January 1993, the fixed-route transit system operated by the City of Waukesha Transit System Utility, Waukesha Metro Transit, consisted of nine bus routes operating a total of about 112 round-trip route miles.

The nine bus routes operated by the City as of January 1993 are shown on Map 55. These routes are primarily radial in design, starting at, or just beyond, the outer limits of the City of Waukesha and terminating in the City's CBD. Seven of the nine routes provide service within the City, with

Map 54

FIXED-ROUTE TRANSIT SERVICE OPERATED BY WAUKESHA COUNTY: JANUARY 1993



LEGEND

NONCOMMUTER BUS ROUTES

- WISCONSIN COACH LINES, INC. ROUTE NO. 2
- MILWAUKEE COUNTY TRANSIT SYSTEM ROUTE NO. 10

COMMUTER BUS ROUTES

WISCONSIN COACH LINES, INC.

- ROUTE NO. 1
- ROUTE NO. 3
- ROUTE NO. 4
- ROUTE NO. 5

MILWAUKEE COUNTY TRANSIT SYSTEM

- ROUTE NO. 79

COMMON ROUTE SEGMENTS

- WITH NO STOPS
- WITH FREQUENT STOPS

TRANSIT SERVICE AREA

- ONE-QUARTER MILE WALK SERVICE AREA

STATIONS AND STOPS

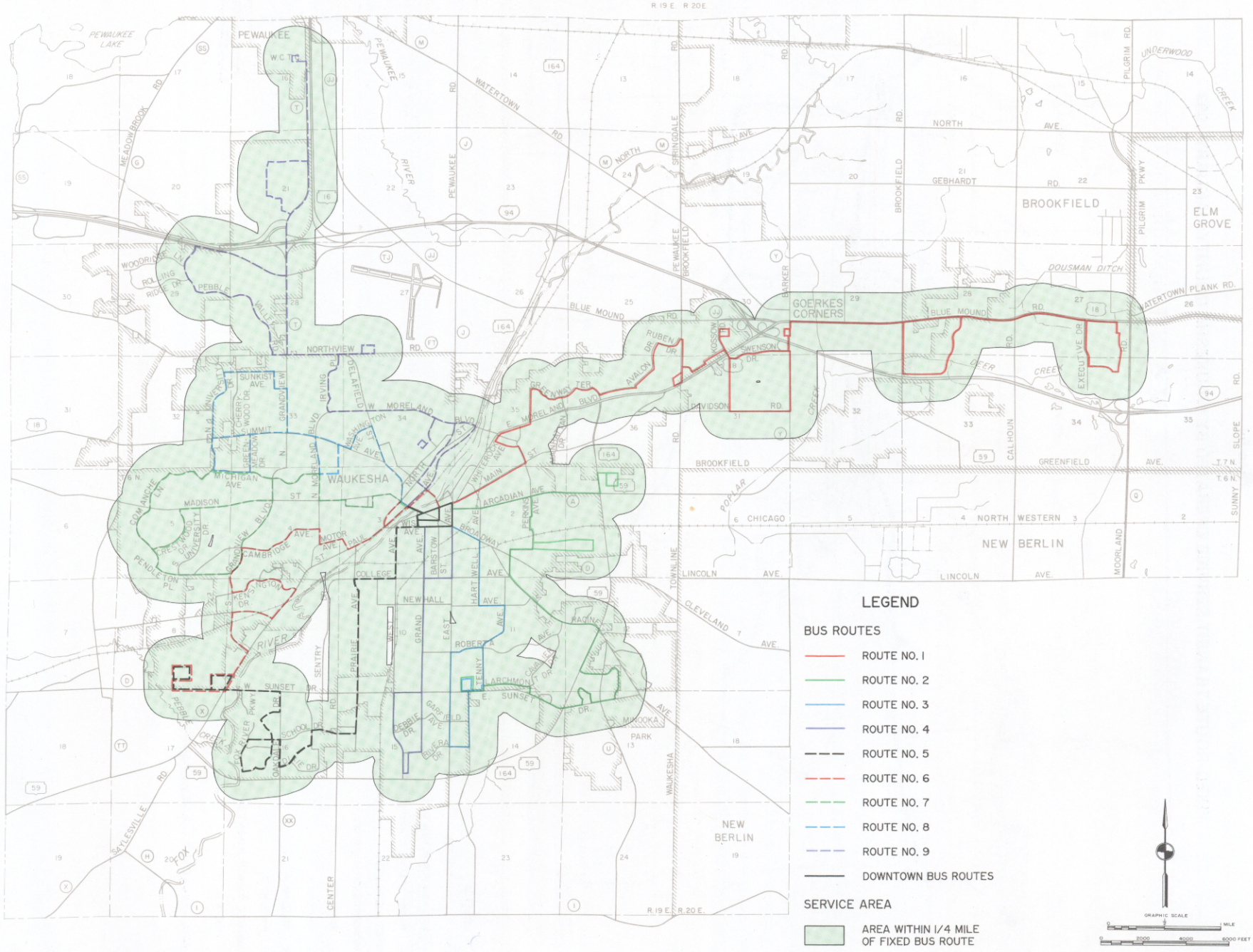
- PARK-RIDE LOT
- HIGHWAY OR FREEWAY RAMP STOP

GRAPHIC SCALE
0 1 2 3 4 MILES
0 8000 16000 24000 FEET

Source: Waukesha County Department of Transportation and SEWRPC.

Map 55

FIXED-ROUTE TRANSIT SERVICE OPERATED BY THE CITY OF WAUKESHA TRANSIT SYSTEM UTILITY: JANUARY 1993



Source: City of Waukesha Transit System Utility and SEWRPC.

only portions operated outside the City's corporate limits, The remaining two routes, in addition to serving portions of the City of Waukesha, serve important traffic generators outside the City; one route serves the Waukesha County Technical College in the Village of Pewaukee, the other route serves the Goerke's Corners public transit station in the Town of Brookfield and the Brookfield Square shopping center and surrounding office and retail developments in the City of Brookfield. All buses meet at the downtown terminal at approximately the same time during peak hours to allow passengers the opportunity to transfer conveniently between bus routes and complete a trip with minimum delay.

The service area for the City's fixed-route transit system is also shown on Map 55. The area shown includes all lands within one-quarter mile of one of the City's bus routes. This area includes virtually all of the City of Waukesha plus small portions of the City of Brookfield, the Village of Pewaukee, and the Towns of Brookfield, Pewaukee, and Waukesha. Bus service is provided by the transit system for 12.5 hours on weekdays, between 6:00 a.m. and 6:30 p.m., and for 10 hours on Saturdays, between 8:00 a.m. and 6:00 p.m. No bus service is provided on Sundays and holidays.

In 1993, the bus fleet operated by the City's fixed-route transit system consisted of 17 buses, all owned by the City of Waukesha.

During calendar year 1992, the Waukesha Metro Transit System carried approximately 461,000 revenue passengers. The basic fare for the City of Waukesha transit system was $0.60.

Intercity Transit Service: In 1993, long-distance intercity transportation service was provided by two private bus companies operating routes with stops within the boundaries of Waukesha County. These companies included Badger Coaches, Inc., and Greyhound Lines, Inc. Intercity services operated by Lamers Bus Lines, Inc., and the National Railway Passenger Corporation, commonly called Amtrak, also passed through Waukesha County, although the buses and trains of these carriers did not stop within the County.

The service provided by Greyhound Lines consisted of 6 trips in each direction via IH 94 daily between Milwaukee, Madison, and Minneapolis-St. Paul. Greyhound service also included one trip daily in each direction via USH 41/45 between Milwaukee, Wausau, and Rhinelander; one trip daily in each direction via USH 41/45 between Milwaukee and Green Bay; and one trip daily via USH 41/45 between Milwaukee and Stevens Point. Four of the westbound Greyhound runs and all of the eastbound runs operating via IH 94 stopped at the Goerke's Corners (IH 94 and USH 18) park-ride lot; two of the westbound and eastbound runs also stopped at the Summit (IH 94 and STH 67) park-ride lot. All Greyhound runs operated via USH 41/45 stopped at Menomonee Falls. Service provided by Badger Coaches, Inc., consisted of six trips daily in each direction via IH 94 between Milwaukee and Madison plus one additional westbound trip on Fridays and Sundays and one additional eastbound trip on Sundays. All daily runs included stops at the Goerke's Corners and Summit park-ride lots in Waukesha County, but the additional Friday and Sunday runs stopped only at the Goerke's Corners park-ride lot.

Specialized Transportation Services

Waukesha County: The Waukesha County Department of Aging is the principal provider of specialized transportation services within the County. During 1993, the Department directly provided specialized transportation service, using County employees and equipment, under two programs: the Ride-Line program and the parallel commuter bus program.

The Ride-Line program offers a countywide door-to-door transportation service to elderly and disabled persons, subject to some qualifying restrictions. The service area is limited to trips with origins and destinations within Waukesha County, with limited exceptions for medical-purpose trips into Milwaukee County. The parallel commuter bus program is the County's Federally required program for providing transportation services for disabled individuals unable to use the regular all-day bus service provided for the general public in Waukesha County and is operated in conjunction with the Ride-Line program. Under this program, the County offers an accessible door-to-door van service to disabled individuals for trips with origins and destinations within one mile on either side of the two regular all-day bus routes subsidized by Waukesha County in the major travel corridor between the City of Waukesha and the Milwaukee CBD.

During 1993, both services were available on weekdays from 6:30 a.m. to 6:00 p.m. and on Saturdays from 10:00 a.m. to 6:30 p.m., excluding holidays,